

Dear Secretary Westphal:

This responds to your letter of March 19, 1999, concerning our report to you on the feasibility of deepening the Savannah River Navigation Channel. Your letter requests either a supplemental or revised report and EIS to address the concerns raised in your letter and attached comments from your review staff.

Enclosed is a Supplemental Information Report (SIR) which lists the review comments and provides specific responses. We recommend the SIR be included as an integral part of the original report. We have provided a new Table of Contents for the report to reflect this addition. The original report was developed in conjunction with Corps staff and subjected to Corps Independent Technical Review prior to submitting the report to you. The issues were also discussed in several meetings with Corps Headquarters. The Supplemental Information Report has also been coordinated with HQUSACE and ASA(CW) staff.

The following is a quote from the SIR which puts its purpose into context of the overall project and the status of the analysis.

“GPA recognizes the August 1998 Report and Tier I EIS, including this SIR, are not at the level of detail that the Corps of Engineers would normally develop at this stage of the project development process. Nevertheless, it is GPAs strong view that the August 1998 report, the Tier I EIS, and this SIR, are fully sufficient to establish the feasibility of the project and fully consistent with NEPA, the Principles and Guidelines, and Corps planning criteria. GPA has examined the issues raised and find that the fundamental feasibility of the requested authorization, i. e., a channel up to and including 48 feet deep, remains strong.

“The design phase of the project includes many studies and evaluations to respond to concerns expressed during public and agency review of the basic report and Tier I EIS, to refine the details of the analysis, and to reach consensus with a broad range of interests on potential impacts and a mitigation plan.”

Based on the information shown, we respectfully request timely and favorable support for the proposed authorization. If there are any other questions or information you need, please let us know as soon as possible.

Thank you very much for your consideration.

SUPPLEMENTAL INFORMATION REPORT
IN SUPPORT OF THE FEASIBILITY
OF DEEPENING SAVANNAH HARBOR

APRIL 1999

This Supplemental Information Report (SIR) is furnished to the Assistant Secretary of the Army (Civil Works) in response to questions raised by that office, dated March 19, 1999, concerning the August 16, 1998, report to the Assistant Secretary by the Georgia Ports Authority (GPA) on the feasibility of deepening the Savannah River Navigation Channel up to and including a depth of 48 feet. The paragraphs are numbered in the same order as the comments in the letter dated March 19, 1999, to Mr. Doug Marchand from the Assistant Secretary of the Army (Civil Works)

GPA recognizes the August 1998 Report and Tier I EIS, including this SIR, are not at the level of detail that the Corps of Engineers would normally develop at this stage of the project development process. Nevertheless, it is GPA's strong view that the August 1998 report, the Tier I EIS, and this SIR, are fully sufficient to establish the feasibility of the project and fully consistent with NEPA, the Principles and Guidelines, and Corps planning criteria. GPA has examined the issues raised and find that the fundamental feasibility of the requested authorization, i. e., a channel up to and including 48 feet deep, remains strong.

The design phase of the project includes many studies and evaluations to respond to concerns expressed during public and agency review of the basic report and Tier I EIS, to refine the details of the analysis, and to reach consensus with a broad range of interests on potential impacts and a mitigation plan.

1. Private berth dredging costs.

Comment: The comment notes that concerns were raised by terminal operators that private berth dredging costs may be increased as a result of; a.) potential water quality and dissolved oxygen impacts, b.) increased erosion from the proposed deepening, and c.) increased silt loadings. In addition, concerns were expressed that low cost agitation dredging may be prohibited and more costly dredging may be required.

Response:

a.) Potential water quality and dissolved oxygen impacts. With respect to berthing area maintenance dredging, agitation dredging is the same issue as dissolved oxygen impacts and is included with discussion of that issue. EPA is considering modifications to dissolved oxygen standards in the river. This in turn may affect existing Corps permits for berth maintenance dredging, particularly agitation dredging, the most common and least costly berth maintenance dredging method. Dissolved oxygen levels in the Savannah River are sometimes low, nearing or falling below the allowable water quality limits of 3.0 parts per million (ppm). Agitation dredging causes suspension of various organics in the water column which may further reduce dissolved oxygen. It is not known at this time whether agitation dredging permits would be affected by EPA water quality standard adjustments or Corps permit action.

DO impacts are addressed at Paragraph 8.2.14, page 81 of the Main Report. No changes in DO levels are anticipated as a result of the deepening. Thus, no impacts on the maintenance dredging permits are expected. The principal reason is that an oxygenation system is part of the project design and the cost to fully mitigate any DO impacts is included at \$24 million. Page H-532 of Enclosure H to the report describes several oxygenation system options and provides costs based on costs of existing similar systems elsewhere. The cost estimate to mitigate all dissolved oxygen impacts was made on the basis of the worst case assumption that no decrease in DO would be allowed to occur as a result of the project. Further, the most costly system available to mitigate those impacts was used for the feasibility analysis. Other water quality issues such as salinity and chloride levels do not affect private berth dredging and are addressed in paragraphs 6.a. and 6.b., respectively.

Because DO impacts will be fully mitigated, it is reasonable to believe that the practice of agitation dredging would not be affected by the channel deepening. GPA will investigate in the Tier II study the extent to which EPA and the Corps may alter existing dredging permits and whether agitation dredging would be affected in any way as a result of channel deepening. GPA will reflect these findings in the project analyses during the Tier II EIS and feasibility study update.

The cost to mitigate dissolved oxygen impacts is truly a "worst case" scenario for this issue and is one of several similar elements of analysis which appear to support a conclusion that the analysis is in fact a worst case analysis. Under any other reasonable and rational set of assumptions, the project would have fewer environmental impacts, less costs of mitigation, and would still be well justified based on standard federal planning guidelines.

b.) Increased erosion from the proposed deepening. The EIS, Sec. 5.8, page 207 addresses this point. In summary of the report, hydrodynamic model studies indicate no significant changes to tidal elevations and a reduction in currents as a result of a larger channel cross section. There is expected to be a commensurate reduction in erosion, not an increase.

c.) Increased silt loadings. The Main Report at Paragraph 5.2.3, Page 31, indicates that while shoaling patterns may likely be altered, no increased shoaling is anticipated as a result of the project. This is because the annual shoaling rate has been stable for 45 years and no new sources of siltation are known to result from deepening the channel. Engineering Appendix B, Paragraph 7.2.3, Page 77 through Paragraph 7.2.4, Page 85, goes into detail concluding that there will be no increase in shoaling, but possible locations of shoaling will shift slightly upstream. The Report also concludes that the modified Kings Island Turning Basin will capture most of the shift in siltation. Thus, it is highly unlikely that there would be any change in siltation at individual berthing areas. Again, notwithstanding the engineering analysis in the report which indicates no potential increase in siltation, GPA will coordinate additional analyses with the concerned parties during the detailed design phase of the project.

2. Engineering design detail.

Comment: The concern raised is that the engineering design detail is insufficient according to ER 1110-2-1150 to support the base line cost needed for authorization.

Response: GPA recognizes that the level of detail is less than what the Corps would normally provide based on ER 1110-2-1150. The additional detail would have been provided had it been critical to establish the feasibility of the project. However, the available information is sufficient for the feasibility determination. The principal cost issues with respect to level of detail, the oxygenation system and the water supply intake mitigation measures, were raised late in the study process. As a result, the report includes a "worst case" analysis to ensure the project feasibility would not be adversely affected by potential later design changes and defers to the detailed engineering and design phase to refine the design and costs.

GPA examined the sensitivity of the feasibility analysis to the assumptions regarding the costs of the dissolved oxygen and water supply intake mitigation measures. Corps of Engineers Regulation ER 1105-2-100, Paragraph 5-23, Page 5-44 addresses the Federal policy objectives of cost estimates in feasibility reports. Subparagraph c., on Page 5-45 states, "The goal [of cost estimates] is a final project cost that will be within 20 percent of the estimated project cost in the feasibility report after appropriate adjustments for inflation." This analysis has met that goal. The comment also indicates a concern that the cost estimate should be sufficient to avoid the need for reformulation or reauthorization as a result of potential cost increases. The 20 percent objective and the reauthorization references relate to Section 902 of WRDA 86 which places limits on cost increases for authorized projects. This analysis has also met this goal by including maximum potential costs.

Since this is cost estimate is a worst case scenario, the actual project cost would not be any greater as a result of any potential changes to these design features and very likely it would be significantly less. Thus, there is no risk of triggering the reauthorization requirement of Section 902 of WRDA 86 based on these features. With respect to potential future reformulation, the recommended authorization is for a channel depth up to and including 48 feet, although GPA firmly believes that the report establishes an NED Plan channel depth of 48 feet. The unspecified depth in the report and recommended authorization is in deference to concerns about resolution of other environmental issues which theoretically could affect plan optimization. Inasmuch as the plan formulation will be fully reviewed during the design phase of the project to address optimization, the value added of a more detailed engineering analysis of the DO and water intake mitigation features at this time is not clear. What is clear is that the current level of detail is sufficient to establish feasibility and the appropriate level of detail must be included in the final design phase.

3. Side slope stability for new work dredging.

Comment: The comment indicates possible instability of the side slopes resulting from vertical cuts and attendant potential impacts to adjacent structures and the environment as a result of side slope sloughing. The comment further notes that the cut is deep enough and neighboring structures close enough that the channel might either have to be moved or narrowed.

Response: The report addresses this issue at Paragraph 7.1.5, Page 44 of the Main Report and at some length in the Engineering Appendix, Appendix B, at Pages 29 through 38. The channel design is based on continuing the existing side slopes toward the channel bottom in a three horizontal to one vertical slope to achieve the desired project depth. The existing side slopes would remain unchanged. Thus, the outer limit of a vertical cut would have to be made at least 18 feet inside the existing toe of slope. This is based on a vertical depth of six feet and

horizontal distance of 18 feet. This would result in a narrower bottom width, 464 feet for a 48-foot channel depth, but retain the full 500-foot bottom width at a depth of 42 feet for existing vessel traffic. It would also continue the current practice of one way traffic for larger vessels. The side slope design and one way traffic were coordinated with the local pilots who stated they already observe one way traffic for larger vessels. As a result, there would be no increased transportation costs resulting from one way traffic as the current vessel operating practices would not change as a result of the project deepening. Smaller vessels will still be able to move in two-way traffic except when a larger vessel is in the channel. Because this is also the existing practice, the economic analysis would not be affected by the one-way traffic requirement. In addition, it should be noted that a bottom width of 464 feet at the 48-foot channel depth is very generous for one way traffic. It is and has always been intended to refine this design during the design phase of the project. It can be easily seen that the project is designed specifically to avoid impacts to shoreline structures. However, if detailed design shows those impacts may occur as a result of the current plan, channel bottom widths can be reduced further to avoid those impacts. GPA has concluded that the project justification could only be enhanced by refinement of the channel design width and further analysis could be done during the design phase without affecting the feasibility of the project.

Attachment A shows a schematic of the channel design to demonstrate the very conservative nature of the feasibility level estimates, i. e., a worst case scenario.

GPA notes that these issues and assumptions were raised and discussed early in the study process and were thoroughly coordinated with the Corps of Engineers at all levels. The approach was supported by the Corps and GPA relied on that coordination process to identify and resolve such issues as an integral part of the study process.

4. Channel Design Vessel.

Comment: The project benefits assume use of the Sovereign Maersk, but the channel is designed to accommodate the smaller Regina Maersk size vessel. Either the design should be increased or the benefits decreased.

Response: This comment is based on an incorrect understanding that the project benefits include use of a vessel the length of the Sovereign Maersk, 1138 feet. The design vessel is the Regina Maersk at 1044 feet long. Both channel design and benefits are based on the Regina Maersk size vessel being the maximum length vessel to call at the port during the period of analysis. Since no benefits were claimed for the larger Sovereign Maersk, no benefits need be deleted.

Paragraph 7.1.1, Page 43 of the Main report and Paragraph 6.3, Page 24 of the Engineering Appendix B indicate a design vessel of 1044 feet length. In addition, Exhibit 4-20 on Page 61 of the Economic Appendix C indicates the deepest draft vessel included in the economic analysis is 47 feet, not the 48.5 feet draft of the Sovereign Maersk. There appear to be only two references to the Sovereign Maersk in the economic analysis. One is found on Page 61 of the Economic Appendix. It is included as a footnote to support a statement that there is a rapid change in the make up of the world fleet. No inference can be drawn that such a vessel would ever call at Savannah with its channel design dimensions nor are there any transportation savings benefits were attributed to such a vessel. The other mention is on Page 114 of the Economic Appendix.

It refers to the sensitivity analysis of potential future fleet mix, not to any expectation that such a vessel would be used at Savannah.

Thus, the comment is incorrect and the analysis has not been changed.

5. Traffic Projections.

With all due respect, GPA takes strong exception to the comments about traffic projections and states the reasons below. Nevertheless, the most important aspect of the response to this comment is that although GPA strongly disagrees with the reviewers, the report includes a sensitivity analysis using very pessimistic growth projections of 4% short term, 3% mid term, and 2% long term specified by Corps headquarters. The result was still a well justified project at a benefit to cost ratio of just under 1.5. As to the specific comments:

a.) Comment: The short term growth rate appears high given that over the last 10 years foreign traffic at Savannah has increased at an annual rate of only 3.4 percent.

Response: This comment is misleading in several respects. First, it references growth in general foreign traffic and second, uses a 10 year period of record upon which to base future projections. Both approaches to evaluation are not reasonable assumptions for this case. The growth projections in the report are for containerized shipments as distinct from general foreign traffic and the proper period of record upon which to base projections of containerized shipments should be much less than 10 years.

As to the first point, the commodity projections do not relate to foreign traffic as a general category as implied by the comment but rather to the growth of containerized shipments. The commodity projections in the report are very clear on this point and the benefit analysis addresses containerized shipments as a specific category of shipments. It is well known and well documented in all the waterborne commerce literature and data that growth in containerized shipments has dramatically exceeded growth in all other categories of shipments in recent times. Hence, it is not surprising that growth in containerized shipments is expected to exceed growth in general waterborne commerce over the near term for the Savannah project. Exhibit 3-3, in the Economic Appendix C, Page 21 shows an average annual growth of containerized shipments at Savannah over 10 years of 8.1% and the most recent three years show a growth rate of 9.4% per year. Second, the comment refers to the 10 year record upon which to base future projections. The containerized shipping business has changed so much in recent years that ten year old data are not particularly relevant to current conditions or to future expectations for containerized shipments. Projections in the report were based on more recent and more relevant data. As noted above, containerized shipments at Savannah have grown at an annual rate of 8.1% over 10 years and 9.4% over the past three years which includes double digit growth in two of the last three years. Nevertheless, a modest 6.1% short-term growth rate was used for this analysis.

The information to support the projections is in the Economic Appendix and includes extensive data, charts, and tables which address the projections explicitly. A sensitivity analysis was also done using very conservative projections suggested by Corps reviewers. The result still clearly supports a justified project.

b.) Comment: The latest competitive trends data also indicate the need to reexamine the trade forecasts due to a slow down in shipping activity caused by the global economic contraction.

Response: Again, the comment does not take into account the distinction between general waterborne commerce and containerized shipments. Further, there are many positive reports that the global economy is recovering. The following recent containerized shipping growth information is taken from readily available reports from the American Association of Port Authorities, copies of which are included as Attachment B. They represent East Coast, West Coast, Asian, and European ports.

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|----------------|---|
| -Long Beach: | 1998 is up 10.3% over 1997. October 1998 is up 17.3% over October 1997. November 1998 is up 18.4% over November 1997. January 1999 is up 10.8% over January 1998. February 1999 is up 17.4% over February 1998. |
| -Seattle: | 1998 is up 4% over 1997 |
| -Charleston: | 1998 is up 5% over 1997. |
| -Jacksonville: | 1998 is up 11.6% over 1997. |
| -Palm Beach: | 1998 is up 14.9% over 1997. |
| -Singapore: | 1998 is up 7% over 1997. |
| -Rotterdam: | 1998 is up 10% over 1997. |

In discussing this issue previously with the Corps, GPA agreed to update the analysis during the design phase to reflect any change in projections which might result if the global economic slow down continues or containerized shipping trends change. However, there appears to be no evidence in available 1998 data which might indicate the 6.1%, short-term growth projection for Savannah is inappropriate.

c.) Comment: The June 1998 DRI forecast indicates, "The possibility that the Asian crisis will be worse than anticipated is rising."

Response: A DRI June 1998 forecast does not affect this analysis for two reasons. First, it deals with the general economic outlook, not containerized shipping which has continued to grow significantly even the face of a world economic slow down as noted above, and second, there are more current reports that the "Asian economic flu" is on the wane. Nevertheless, recognizing the uncertainty that the world economic situation introduces into the analysis an update will be done during the design phase. There appear to be no hard data that would indicate the current projections are insupportable. In fact, all the hard data available, noted above, indicate the growth projections are at least reasonable and more likely on the conservative side.

d.) Comment: Consideration must be given to vessels using the Port of Charleston as an alternate port.

Response: All competing ports were considered thoroughly in the economic analysis. Discussion of the multiport analysis is contained in the Economic Appendix C, Section 5, beginning on Page 69. Specifically, Exhibits 5-1 and 5-12 through 5-19 provide extensive and compelling data that Savannah is comparable to and perhaps more competitive than other regional ports including Charleston. The extensive data displayed show that there is no reason to

believe that either port has a significant competitive advantage over the other. Exhibit 5-1 shows number of terminals, number of berths, total berth length, number and types of cranes, channel depth, berth depths, port acreage, TEU storage capacity, and rail connections for all regional ports. This exhibit shows that Savannah is quite competitive with all other regional ports. Exhibits 5-12 through 5-19 show that shipping costs through Savannah are competitive with other regional ports for virtually all origin and destination ports and Savannah has a slight advantage in many cases. The conclusion that Charleston and Savannah will not draw commerce from each other is well supported by existing documentation as noted.

e.) Comment: A comparison with long term growth projections of 3.9% for the Port of Oakland is made and a reference is made to a "consensus of various shippers" of a long term growth rate of 4%.

Response: First, all ports are different and there may well be some differences between Savannah and Oakland that could account for a 1% or even greater difference in long term growth projections at Savannah versus Oakland.

Second, no reference material is available concerning the "consensus of various shippers" that term growth would be 4%. Long term growth projections in the report were made as described thoroughly in Economic Appendix C. The analysis was prepared by Booz-Allen & Hamilton (BAH), a world class transportation economics consulting firm. In preparing the economic analysis, BAH used internally generated information as well as information from many other highly respected sources in the maritime industry. The 4.8% annual long term growth rate was supported by projections of DRI, AAPA, COE Waterborne Commerce Statistics, ICF Kaiser Trade and Transportation Group, the WEFA Group (associated with the University of Pennsylvania), Journal of Commerce PIERS data, U. S. Department of Commerce, U. S. Department of Energy, and the U. S. Department of Agriculture. The projections were made on the basis of worldwide data and projections, regional data and projections, and local data and projections. The Economic Appendix provides a step by step analysis with references to support the growth projections used.

f.) Comment: The "concern" is that the growth at Savannah will be lower than expected because of competition from Charleston.

Response: As discussed above in item d.) and in Section 5 of the Economic Appendix, the report examined the potential for competition from Charleston and other regional ports very carefully and concluded that Savannah is very competitive both in physical attributes and shipping costs. Thus, there is no reason to believe either Savannah or Charleston will out-compete the other.

g.) Comment: The sensitivity analysis uses 4%, 3% and 2% growth for short term, mid term and long term projections. The result indicates the analysis is sensitive to growth assumptions and the sensitivity test is not sufficient to address this issue.

Response: There is extensive analytic support for the projections in the report and there is no analytic support for the very conservative projections prescribed by the Corps for the sensitivity analysis. Nevertheless, even with low growth projections specified by the Corps, the benefit to cost ratio is still well in excess of 1.0 at 1.47 and the project is well justified.

h.) Comment: In the summary of the Traffic Projection comments, the Corps notes that tonnage data for 1998 should be included and growth rates recalculated based on that information.

Response: GPA has agreed to reevaluate the economic justification during the design phase. Standard Corps planning practices require analyses to be made on the basis of long-term trends rather than on individual annual fluctuations. Thus, any sharp upturn or downturn in single year data would be significantly moderated when coupled with data for the past 5 to 10 years. For example, the average annual increase in containerized shipments at Savannah for the past 10 years is 8.1%. If one assumes no growth at all for 1998, the average annual rate would reduce to 7.4%, still well above the 6.1% projected in the report. There would have to be a decline in 1998 of approximately 15% just to yield an average annual growth rate of 6.1% for the last 10 years. Thus, the projection in the report is not very sensitive to a stagnation or even a sharp downturn in 1998. As noted earlier, containerized shipments for 1998 at every port reporting thus far have increased over 1997. Preliminary data for Savannah for 1998 indicates continuing strong growth in containerized shipments as well. Thus, this analysis is very conservative as it stands.

i.) Comment: Also in the summary of Traffic Projection comments, the Corps asks for information on competing ports.

Response: As discussed in item d.) above, a complete multiport analysis is found in Section 5 of the Economic Appendix. It includes comparison of competitive physical attributes for all major ports in the region as well as comparative transportation costs to and from the hinterland through each port.

6. Environmental mitigation analysis and incremental mitigation costs.

Comment: The comment requests GPAs plans for refining the elements and costs of environmental mitigation for the incremental channel depth alternatives.

Response: There are three principal water quality mitigation considerations; dissolved oxygen, chloride levels, and salinity. The environmental impact assessment model to be applied in the Tier II EIS is being refined in the design phase of the project. Model runs will show more precisely how much change in DO, chlorides, and salinity can be expected from each increment

of channel depth. This in turn will lead to more precise costs for mitigation. In addition to these three potential impacts, concerns have been raised about impacts on striped bass and shortnose sturgeon. The three water quality concerns, the striped bass, and the shortnose sturgeon concerns are addressed in detail as follows.

a.) Dissolved oxygen. Current cost estimates for an oxygenation system to mitigate potential dissolved oxygen impacts were based on actual costs of similar facilities at other nearby locations. The oxygenation system is addressed beginning at Page H-534 of Enclosure H to the report. The conclusion was that \$24 million first cost plus \$550,000 annual operation and maintenance (O&M) would be the highest possible cost. A much more likely cost would be \$12 million first cost and \$550,000 annual O&M. Nevertheless, the analysis used the higher cost in the current estimate. It is unlikely that the first cost would change significantly with incremental channel depths because the majority of the cost involves fixed plant equipment needed to distribute oxygen to several locations in the estuary. Annual O&M to supply certain levels of oxygen would be reduced relatively proportionately for lesser channel depths. Once the model runs are completed in the design phase and the actual potential changes in DO are known, specific cost calculations will be made for each increment of channel depth. Because the first costs are not expected to vary much, the total effect of a refined cost analysis on plan optimization for this feature is expected to be small.

b.) Chlorides. The current cost estimate for chloride mitigation is \$46 million. This cost was provided by the City of Savannah after consideration of maximum costs to the City if it is unable to meet its contractual obligations to provide water to its customers with acceptable chloride levels. The maximum cost is based on the cost of physically moving the city's water intake far enough upstream to completely avoid any impacts of dredging. The \$46 million cost estimate is to make absolutely certain enough funds are programmed into the project to cover any eventuality. This cost is not likely to vary from channel increment to channel increment inasmuch as it is a cost to move the intake location and is not very dependent on the channel depth. It is possible that there would be some threshold depth short of which this mitigation feature would not be needed. Although a sensitivity analysis showed that inclusion or removal of this feature at each increment of channel depth would not affect the plan optimization, once the model is run to determine the need for this feature, the economic data will be fed back into the NED optimization analysis.

c.) Salinity/fresh water tidal marsh. Salinity impacts may reduce the extent of future succession of fresh water tidal marsh. Costs to mitigate these impacts will be refined in the design phase of the project based on results of the model runs which will show salinity changes. Salinity changes in turn will lead to a refinement of potential loss of wetlands. Among the mitigation options addressed in the report are to purchase nearby uplands and/or to purchase nearby fresh water wetlands. In either case, the uplands would be converted to fresh water marsh or the existing fresh water marsh would be enhanced.

The prediction of impacts on fresh water tidal marsh, i. e., where the salinity wedge will move and how much impact it will have, was made based on a series of "worst case" assumptions and represents a worst case scenario. The model used to predict movement of the salt water wedge was calibrated and concurred in by all the agencies including the Fish and Wildlife Service. In using this model, the report concluded that 722 acres of fresh water tidal marsh would potentially be affected. There has been no dispute over this point. The potential loss of habitat value used to determine the proposed mitigation requirements was predicted to represent the worst case future conditions.

The differing views arise from how much impact the movement of the salt wedge would have on the fresh water tidal wetlands. The U. S. Fish and Wildlife Service believes the effects would be more severe than the report analysis shows. No one who has suggested that the impacts would be any worse than the FWS estimates. Notwithstanding the analysis which shows that the impacts on the fresh water tidal marsh would likely be small, the FWS estimate was used as the basis for the proposed mitigation plan. To be even more conservative, the analysis ascribed maximum impacts of a 50-foot channel to all channel increments, again just to ensure that any refinement of analysis during the design phase would not adversely affect project justification.

d. Striped bass. Declining populations of striped bass in the Savannah River has been a major concern to many agencies and interests, including the Georgia Department of Natural Resources (GADNR). While there is no indication of any direct impacts to striped bass populations from channel deepening, GADNR is concerned that the deepening itself or mitigation for other project impacts could interfere with current GADNR efforts to restore striped bass to the Savannah River. No information is available on the causes of declining populations and GADNR is not at the stage of developing specific recovery plans. As a result, costs have been included as part of the mitigation plan for this project to assist GADNR in its striped bass recovery efforts and to ensure the deepening project does not interfere with GADNRs recovery plans.

e. Shortnose sturgeon. There is no indication of shortnose sturgeon currently existing in the Savannah River. However, there is some historic information that some shortnose sturgeon did reside in the Kings Island Turning Basin at one time. It is believed, but not certain, that the attraction was the depth of 50 feet or greater resulting from advanced maintenance dredging practices of the Corps of Engineers. While there is no indication whether the sturgeon remain in the estuary at this time, additional studies will be conducted during the design phase to make that determination. To ensure sufficient funding is available for mitigation should shortnose sturgeon be found, provision has been made to deepen a nearby area to a similar depth as the Kings Island Turning is currently. This is expected to provide alternate habitat for any shortnose sturgeon in the area.

Attachment C shows total mitigation costs to be \$79.61 million. This yields an average annual cost of the entire mitigation plan of \$6,457,000. The attachment also shows the two-foot incremental net benefits for the 46 to 48-foot increment to be \$6,521,000. The implication of

this is that the increment from 46 to 48 feet would still yield positive incremental net benefits of \$64,000 even if no mitigation is required at 46 feet and full mitigation is required at 48 feet. It can be concluded that the plan optimization in two-foot increments is not affected in any way by the mitigation plan costs.

This conclusion does not hold for a one foot incremental analysis because the one foot net incremental benefits are not great enough to offset the entire cost of the entire mitigation plan. It then follows that the only way the plan optimization might be affected by mitigation costs to yield something less than a 48 foot optimum plan is by requiring zero mitigation at the 47 foot increment and the full \$79,610,000 mitigation costs at the 48 foot increment. Such a scenario is so unlikely that it seems quite safe to conclude that the plan optimization is not sensitive to any rational range of mitigation costs.

7. Cost inconsistencies.

Comment: The comment indicates some inconsistencies in cost data among various sections of the Report and EIS.

Response: Review of the current documents indicated one inconsistency. Section 3.6 contained some costs which were incorrectly updated from an earlier draft. A corrected page is included as Attachment D. In reviewing the cost data, it was discovered that the dredging cost for the 48-foot alternative had been incorrectly entered in Table 13-1. The correction does not change the NED Plan selection. Corrected source tables are included in Attachment D.

8. Cost sharing for chloride and oxygenation mitigation.

Comment: The comment indicates further justification is needed for cost sharing these mitigation features and to establish whether less costly measures are available.

Response: Both issues arose at a very late stage of the planning process. In order to complete the report in time for consideration in WRDA 98, "worst case" assumptions were made about costs and types of mitigation. The costs shown are indeed "worst case" and there very well may be less costly options. See also the discussion in Item 6 above for more detail. As long as the project is justified with these maximum costs included, the fundamental decision of whether the project is economically justified is not affected.

The question of cost sharing these features is clearly a Federal policy decision. GPA is not in a position to comment on the Corps District Counsel's view that the city may have no legally compensable interest if adverse water quality impacts occur. However, GPA understands that many impacts routinely mitigated in Corps projects are not compensable in the Fifth Amendment sense. Rather they are mitigated as a matter of public policy and fairness if they are related to the project. Environmental impacts are an obvious example. GPA recommends including

mitigation for all direct project effects as part of general navigation feature costs. Model studies during the design phase will determine the precise impacts and appropriate mitigation would be developed on that basis.

Exclusion of the \$46 million from the 10 percent additional contribution was in error and has been corrected. Revised costs are included

9. Environmental requirements.

Comment: The comment asks that GPA work with Corps Headquarters to revise or supplement the report to reflect the views of the Fish and Wildlife Service.

Response: We observe that the views of the Fish and Wildlife Service and all the other agencies are already included in the agencies' own words in Enclosure H to the report and in comments submitted (or a decision not to submit comments) in response to the Final Tier I EIS. Their views were also expressed directly to you in their responses to the 30 day state and agency review. We understand these comments would be considered in the Report of the Chief of Engineers. In addition, in order to address all the concerns raised by all the agencies and other interests in response to the draft EIS, GPA proposed an issue resolution process and included it in the Final Tier I EIS. The issue resolution process includes full participation of all interests in an orderly evaluation of all impacts through a Stakeholders Evaluation Group which would in turn give appropriate impact assessment and mitigation recommendations to GPA. Any agency with statutory responsibility for any of the resources involved could block the project, i. e., "pull a kill switch," if they are not satisfied with the results. The FWS participated in developing this process and accepted it. The views of all the agencies are extensively and prominently displayed in the report. Nevertheless, there is a need to continue to involve the FWS and all other agencies every step of the way during the design phase of the project and through the SEG. The Tier II EIS will fully document all public and agency involvement and comments.

10. Fish and wildlife mitigation.

Comment: The comment states that the "worst case mitigation plan" has not been identified and focuses on concerns for mitigation of fish and wildlife impacts.

Response: The evaluation does represent the "worst case" for several reasons. First, the mitigation plan extends well beyond fish and wildlife impacts and includes dissolved oxygen and chloride mitigation features. The total cost of mitigation features is \$79.61 million, one-third of the total project cost. As discussed earlier, the maximum potential impact and costs were included for each element just to ensure the project would be justified even if the "worst case" mitigation requirements occurred. Once model studies are completed during the design phase, these costs will be refined. It is highly likely that they will be revised downward significantly. Having said that, even if mitigation costs do increase, there are sufficient excess net benefits

such that the project justification would not be threatened until and unless total mitigation costs increase six-fold.

Mitigation costs for fish and wildlife impacts represent 12% of the total mitigation costs and 4% of total project costs. If the mitigation costs included for dissolved oxygen and chlorides are indeed at the maximum, costs for fish and wildlife element of mitigation could increase 100 fold without jeopardizing project feasibility. Thus, significant increases in these mitigation costs would not significantly affect the project economics.

The report describes the worst case scenario. There is no indication that the report has omitted any necessary assumptions or understated some potential impacts or costs.

11. Dredged material management plan (DMMP).

Comment: The comment indicates that a revised dredged material management plan for the entire 50 year project life should be included.

Response: This issue is discussed at length in the report and its treatment was coordinated with the Corps at all levels and agreed to early in the study process. There is an existing dredged material management plan for maintenance of Savannah Harbor. It was determined during the study and is described in the report that the deepening project would not affect the existing DMMP and there is no need to change it. Inasmuch as there are no changes to be made to the current plan, it was incorporated by reference. Discussions of the DMMP are found at Sec. 7.1 and 7.2 of the Engineering Appendix B of the main report.

In addition to the conclusion reached during coordination with the Corps, at the request of the Chief, Planning Division, Savannah District, this issue was the subject of a specific meeting between GPA and Savannah District senior level representatives in September 1998. It was decided at that meeting that a reconnaissance level evaluation would be done to ascertain the "base plan" for disposal of new work material to ensure it would not affect the existing DMMP. That analysis was done and is included in Section 7 of the Engineering Appendix. The conclusion is that the incremental deepening of the channel would not affect the long term management of dredged material disposal in Savannah Harbor.